WHAT IS CLAIMED IS:

1. A method of equalizing electrical delay of a plurality of signal paths, comprising:

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measuring electrical delay for each of the plurality of signal paths over a selected frequency range;

determining a linear relationship between phase and frequency for said frequency range at least in part through reference to measured electrical delay information; and

modifying the delay of one or more paths of said plurality of signal paths based at least in part on said linear relationship to provide a substantially equal electrical delay over said selected frequency range.

2. The method of claim 1, wherein the act of modifying includes controllably adding delay to the one or more paths.

3. The method of claim 2, wherein controllably adding delay comprises:

selecting delays of a binary weighted delay line substantially providing a desired amount of delay.

4. The method of claim 1, further comprising:

selecting as a reference path a path of said plurality of signal paths with a largest delay and adding delay to the other paths of said plurality of signal paths so that their delay is substantially equal to the reference path.

5. The method of claim 1, wherein determining a linear relationship comprises: deriving a phase versus frequency change curve for each path.

6. The method of claim 5, wherein the phase versus frequency change curve is derived by measuring change in path output phase versus change in path input test frequency, wherein a plurality of test signals having incrementally increasing frequencies are input to a path in deriving its curve.

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7. The method of claim 6, wherein the plurality of incrementally increasing test frequencies have incremental increases that are determined at least in part to be sufficiently small to sufficiently reduce phase rollover.

8. The method of claim 5, wherein determining a linear relationship further comprises:

linear fitting the curve to derive an overall slope for the curve.

9. The method of claim 8, wherein the delay for each path of said plurality of signal paths is derived from the linear-fitted slope.

10. The method of claim 1, wherein said selected frequency range is a range of frequencies substantially corresponding to a range of frequencies to be communicated through said signal paths.

11. The method of claim 10, wherein said range of frequencies to be communicated through said signal paths includes a range of frequencies associated with a first communication service and a range of frequencies associated with a second communication service.

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12. The method of claim 10, wherein said range of frequencies to be communicated through said signal paths is a range of frequencies associated with communication services provided by at least one of the communication service group consisting of:

analog cellular telephony;

CDMA cellular telephony;

TDMA cellular telephony; and

PCS communications.

13. A method of phase calibrating signal paths of a multiple beam communication system having a phased array antenna coupled to a beam forming matrix, wherein a plurality of antenna beam signal interfaces are provided by the beam forming matrix for coupling to a plurality of antenna beam signal paths of the communication system, the method comprising:

selecting a first group of antenna beam signal paths from said plurality of antenna beam signal paths for delay equalization;

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selecting a test frequency range and a test frequency increment/decrement;

measuring delay for each signal path of the first group of antenna beam signal paths with respect to said test frequency range at intervals substantially corresponding to said increment/decrement;

determining a relationship between phase and frequency for each signal path of the first group of antenna beam signal paths at least in part through reference to measured delay information associated therewith; and

adjusting a delay of one or more paths of the first group of antenna beam signal paths based at least in part on said relationship between phase and frequency.

14. The method of claim 13, wherein said first group of antenna beam signal paths are associated with a same multiple beam antenna structure.

15. The method of claim 14, wherein said plurality of antenna beam signal paths include a second group of antenna beam signal paths associated with a second multiple beam antenna structure.

16. The method of claim 15, further comprising:

selecting said second group of antenna beam signal paths for delay equalization;

measuring delay for each signal path of the second group of antenna beam signal paths with respect to said test frequency range at intervals substantially corresponding to said increment/decrement;

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determining a relationship between phase and frequency for each signal path of the second group of antenna beam signal paths at least in part through reference to measured delay information associated therewith; and

adjusting a delay of one or more paths of the second group of antenna beam signal paths based at least in part on said relationship between phase and frequency.

17. The method of claim 13, wherein the test frequency range is selected to substantially correspond to signals to be communicated by said communication system.

18. The method of claim 17, wherein said test frequency range is at least 40 MHz.

19. The method of claim 17, wherein said test frequency range substantially corresponds to a cellular carrier frequency assignment.

20. The method of claim 17, wherein said test frequency range substantially corresponds to frequency assignments of two communication services.

21. The method of claim 13, wherein measuring delay for each signal path of said first group of antenna beam signals comprises:

determining change in phase versus change in frequency to track phase shift as the test frequency is swept over the test frequency range.

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22. The method of claim 13, wherein the test frequency increment/decrement is selected to provide increments small enough that a phase roll-over condition can be detected.

23. The method of claim 13, wherein determining a relationship between phase and frequency for each signal path of said first group of antenna beam signal paths comprises:

determining a linear relationship between phase and frequency for each signal path.

24. The method of claim 23, wherein said linear relationship comprises:

deriving a phase versus frequency change curve for each signal path of said first group of antenna beam signal paths and extracting a linear component from the phase versus frequency function.

25. The method of claim 24, wherein the delay for each signal path of said first group of antenna beam signal paths is derived from said linear component.

26. A method for measuring the delay of a transmission path having an input and an output, comprising:

generating a phase change versus frequency change curve for the path;

linearizing the generated curve to form a line; and

deriving the path's delay from the slope of the line.

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27. The method of claim 26, wherein the act of linearizing the curve includes the act of averaging a plurality of curve values using a least squares methodology.

28. The method of claim 26, wherein the act of generating a phase change versus frequency change curve includes:

applying a test signal having a first frequency at the path input;

measuring the phase at the path output;

recording the phase difference between said measured phase and the first frequency,

incrementing the value of the first frequency;

repeating the previous acts until the incremented first frequency has traversed a desired range.

29. A system for adjusting electrical delay of a plurality of signal paths, comprising:

a plurality of signal paths;

phase comparison circuitry providing a comparison of a phase of an input signal with a phase of a feedback signal and providing information with respect to an electrical delay for each of the plurality of signal paths over a selected frequency range;

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processor circuitry in communication with said phase comparison circuitry and operable upon said electrical delay information to determine a linear relationship between phase and frequency for each of the plurality of signal paths for said frequency range; and

phase adjustment circuitry in communication with said processor circuitry and accepting control signals therefrom to modify a delay of one or more signal paths of said plurality of signal paths based at least in part on said linear relationship.

30. The system of claim 29, wherein modification of delays by said phase adjustment circuitry provides substantially equivalent signal path electrical delays with respect to each signal path of said plurality of signal paths.

31. The system of claim 29, further comprising:

a test frequency generator controllably coupleable to said plurality of signal paths, wherein said test frequency generator provide test frequencies throughout said frequency range.

32. The system of claim 31, wherein said test frequencies provided by said test frequency generator are distributed throughout said frequency range substantially at predetermined intervals.

33. The system of claim 32, wherein said predetermined intervals determined at least in part to be sufficiently small to sufficiently reduce phase rollover.

34. The system of claim 31, wherein control of connection of said test frequency generator to a particular signal path of said plurality of signal paths is provided by a processor-based controller of said processor circuitry.

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35. The system of claim 34, wherein said controller operates to couple said test frequency generator to each signal path of said plurality of signal paths separately.

36. The system of claim 35, further comprising:

a switch matrix coupled to said processor-based controller, said test frequency generator, and said plurality of signal paths, wherein said separate coupling of said test frequency generator is provided by manipulation of said switch matrix by said processor-based controller.

37. The system of claim 35, further comprising:

a first antenna structure, wherein said plurality of signal paths are coupled to said first antenna structure.

38. The system of claim 37, further comprising:

a second antenna structure, wherein another plurality of signal paths are coupled to said second antenna structure.

39. The system of claim 29, wherein said phase adjustment circuitry comprises:

a plurality of predetermined amounts of delay.

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40. The system of claim 39, wherein ones of said predetermined amounts of delay are selected under control of a processor-based system.

41. The system of claim 39, wherein said plurality of predetermined amounts of delay are provided by a binary weighted delay line apparatus.

42. The system of claim 29, wherein said processor circuitry comprises:

a processor-based controller adapted to select a reference signal path from said plurality of signal paths based at least in part on said electrical delay information, wherein modification of said delay of said one or more signal paths of said plurality of signal paths is made with reference to said reference signal path.

43. The system of claim 29, wherein said frequency range is a range of frequencies substantially corresponding to a range of frequencies to be communicated through said signal paths.

44. The system of claim 43, wherein said range of frequencies to be communicated through said signal paths includes a range of frequencies associated with a first communication service and a range of frequencies associated with a second communication service.

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45. The system of claim 43, wherein said range of frequencies to be communicated through said signal paths is a range of frequencies associated with communication services provided by at least one of the communication service group consisting of:

analog cellular telephony;

CDMA cellular telephony;

TDMA cellular telephony; and

PCS communications.

46. A system for phase calibrating signal paths of a multiple beam communication system having a phased array antenna coupled to a beam forming matrix, wherein a plurality of antenna beam signal interfaces are provided by the beam forming matrix for coupling to a plurality of antenna beam signal paths of the communication system, the system comprising:

a first group of antenna beam signal paths;

a test frequency source providing test frequency signals in a predetermined frequency range;

a phase comparator coupled to said first group of antenna beam signal paths and to a feedback signal path, wherein said phase comparator is adapted to measure delay for each signal path of the first group of antenna beam signal paths with respect to said test frequency signals provided by said test frequency source;

a processor-based system operable to determine a relationship between phase and frequency for each signal path of the first group of antenna beam signal paths at least in part through reference to measured delay information provided by said phase comparator; and

phase adjustment circuitry disposed in ones of said first group of antenna beam signal paths providing adjustable delays in said ones of said first group of antenna beam signal paths based at least in part on said relationship between phase and frequency.

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47. The system of claim 46, wherein said phase adjustment circuitry is operable to adjust delays in said ones of said first group of antenna beam signal paths under control of said processor-based system.

48. The system of claim 47, wherein said phase adjustment circuitry comprises a binary switched delay circuit.

49. The system of claim 46, wherein said phase comparator is operable under control of said processor-based system.

50. The system of claim 46, wherein said further comprising:

a multiple antenna beam structure, wherein said plurality of signal paths are antenna beam signal paths associated with antenna beams of said multiple antenna beam structure.

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51. The system of claim 46, wherein the predetermined frequency range is selected to substantially correspond to signals to be communicated by said communication system.

52. The system of claim 51, wherein the predetermined frequency range substantially corresponds to a cellular carrier frequency assignment.

53. The system of claim 51, wherein the predetermined frequency range substantially corresponds to frequency assignments of two communication services.

54. The system of claim 46, wherein said test frequency signal in said predetermined frequency range are distributed throughout said predetermined frequency range substantially at predetermined intervals.

55. The system of claim 54, wherein the predetermined intervals are selected to facilitate detection of a phase roll-over condition.